

Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of the claims in the application:

- 1 1. (Original) A method for determining a vehicle trip on a roadway, the method comprising:
2 providing a plurality of vehicle detections from a plurality of gateways;
3 determining a maximum travel time between corresponding pairs of the plurality of
4 gateways;
5 correlating corresponding pairs of the plurality of vehicle detections by determining that a
6 travel time between each of the gateways of each of the corresponding pairs of detections is less
7 than a corresponding maximum travel time;
8 determining a plurality of chainable detections; and
9 determining the boundaries of the trip.
- 1 2. (Original) The method of claim 1 wherein providing the plurality of vehicle detections
2 comprises providing at least one license plate image corresponding to one of the plurality of
3 vehicle detections.
- 1 3. (Original) The method of claim 2 further comprising:
2 determining a vehicle license plate number; and
3 processing the at least one license plate image for verifying the vehicle license plate
4 number.
- 1 4. (Original) The method of claim 1 wherein providing the plurality of vehicle detections
2 comprises filtering a plurality of vehicle transactions for providing the plurality of vehicle
3 detections.
- 1 5. (Original) The method of claim 4 wherein the plurality of vehicle transactions includes at
2 least one ambiguous transaction; and

3 further comprising eliminating at least one ambiguous transaction from the plurality of
4 vehicle transactions.

1 6. (Original) The method of claim 5 wherein the at least one ambiguous transaction includes a
2 conflicting gateway crossing.

1 7. (Original) The method of claim 4 further comprising eliminating dual transactions from the
2 plurality of vehicle detections.

1 8. (Original) The method of claim 1 wherein correlating the corresponding pair of the plurality
2 of vehicle detections further comprises determining whether each of the pair of detections is
3 provided by a corresponding pair of gateways that are disposed logically consistent with the
4 roadway topology.

1 9. (Original) The method of claim 1 wherein correlating the corresponding pair of the plurality
2 of vehicle detections further comprises determining that the travel time between each of the
3 detections is greater than a minimum travel time.

1 10. (Original) The method of claim 1 wherein determining a maximum travel time comprises
2 determining an incident free maximum travel time.

1 11. (Original) The method of claim 10 further comprising:
2 determining an expected travel time; and
3 determining that the maximum travel time is the longer of the expected travel time and
4 the incident free maximum travel time.

1 12. (Original) The method of claim 11 further comprising:
2 detecting a traffic incident; and
3 modifying the expected travel time in response to the traffic incident.

1 13. (Original) The method of claim 1 further comprising waiting for the plurality of chainable
2 detections to be initially processed.

1 14. (Original) The method of claim 1 further comprising waiting for the plurality of chainable
2 detections to be verified.

1 15. (Original) The method of claim 13 further comprising determining a latest time for the
2 plurality of detections.

1 16. (Original) The method of claim 1 wherein determining the boundaries comprises detecting
2 the end of the trip.

1 17. (Original) The method of claim 16 wherein detecting the end of the trip comprises:
2 determining a maximum detection time for the plurality of chainable detections;
3 determining a current boundary time;
4 comparing the current boundary time to the maximum detection time; and
5 declaring the end of the trip in response to determining that the current boundary time is
6 greater than the maximum detection time.

1 18. (Original) The method of claim 1 wherein determining the boundaries comprises detecting
2 the start of the trip.

1 19. (Original) The method of claim 1 further comprising forming the trip by chaining the
2 plurality of chainable detections.

1 20. (Original) The method of claim 1 further comprising waiting for the plurality of chainable
2 detections.

1 21. (Original) The method of claim 20 wherein waiting for all detections that might chain
2 comprises:

3 determining a first time wherein each of the plurality of chainable detections has a first
4 extrapolation region terminating earlier than the first time.

1 22. (Original) The method of claim 21 further comprising:
2 determining a second time wherein each of the plurality of chainable detections occurring
3 later than the first time has a second extrapolation region terminating earlier than the second
4 time, is evaluated for verifying.

1 23. (Original) The method of claim 22 verifying transactions occurring between the first time
2 interval and the second interval time using a video image of a license plate number captured at
3 the time of the detection.

1 24. (Original) The method of claim 22 wherein verifying transactions comprises automatically
2 recognizing the license plate number from the image.

1 25. (Original) The method of claim 22 wherein verifying transactions comprises manually
2 reading the license plate number from the image.

1 26. (Original) The method of claim 1 wherein the plurality of vehicle transactions is provided
2 by at least one of:
3 an enforcement gateway; and
4 a toll gateway sensor.

1 27. (Original) The method of claim 1 wherein each of the plurality of vehicle detections
2 comprises:
3 a time of the detection; and
4 the location of the detection.

1 28. (Original) The method of claim 1 wherein determining the boundaries of the trip comprises
2 using at least one of:
3 a traffic incident; and
4 a set of billing policies.

1 29. (Original) A method for determining a vehicle trip on a roadway having a plurality of
2 gateways disposed according to a roadway topology, the method comprising:
3 providing a model of the topology including gateway connectivity, a plurality of
4 minimum travel times between pairs of gateways, and a plurality of incident free maximum
5 travel times between pairs of gateways;
6 providing a plurality of vehicle detections;
7 providing a set of rules for applying the model;
8 correlating the plurality of vehicle detections by applying the rules to the plurality of
9 vehicle detections; and
10 determining a plurality of chainable vehicle detections forming the trip.

1 30. (Original) The method of claim 29 further comprising determining a plurality of expected
2 travel times between the pairs of gateways.

1 31. (Original) The method of claim 30 further comprising chaining the plurality of chainable
2 vehicle detections for forming a potential trip.

1 32. (Original) The method of claim 31 further comprising verifying a license plate reading
2 corresponding to at least one of the plurality of chainable vehicle detections.

1 33. (Original) The method of claim 32 further comprising waiting for required verification of at
2 least one of the plurality of chainable vehicle detections in the potential trip; and
3 chaining the plurality of chainable vehicle detections to form the trip.

1 34. (Currently Amended) A toll collection system comprising:

1 a plurality of gateways;
2 a trip determination processor comprising:
3 a transaction processor;
4 a vehicle detection correlation processor coupled to the transaction processor and
5 adapted to determine at least one of whether a travel time between pairs of gateways is less than
6 a corresponding maximum travel time and whether a travel time between pairs of gateways is
7 greater than a corresponding minimum travel time;
8 a transaction filter processor coupled to the vehicle detection correlation
9 processor;
10 an end of a trip detection processor coupled to the transaction filter processor;
11 a start of a trip detection processor coupled to the transaction filter processor; and
12 a trip formation processor coupled to the transaction filter processor, the end of a
13 trip detection processor, and the start of a trip detection processor.

1 35. (Original) The system of claim 34 wherein the plurality of gateway is adapted for an open
2 ticket tolling system.

1 36. (Original) The system of claim 34 wherein the plurality of gateway is adapted for a closed
2 ticket tolling system.

1 37. (Original) The system of claim 34 wherein the plurality of gateway is adapted for an open
2 ticket enforcement system.

1 38. (Original) The system of claim 34 wherein the plurality of gateway is adapted for a mixed
2 open ticket, closed ticket tolling system.